

# Curlew Conservation Programme



## Annual Report 2023



**An Roinn Tithíochta,  
Rialtais Áitiúil agus Oidhreacht**  
Department of Housing,  
Local Government and Heritage



**An Roinn Talmhaíochta,  
Bia agus Mara**  
Department of Agriculture,  
Food and the Marine

**Citation – Harrison, S., Kelly, S.B.A., and O’Donoghue, B.G., (2023). Curlew Conservation Programme Annual Report 2023. National Parks & Wildlife Service.**

Cover photo: Adult Curlew in Slieve Aughties 2023

(Photo: Laura Hynes/CCP)

**All photographs taken under licence from NPWS**

Given the conservation status of the species, the exact locations of Curlew breeding attempts are held by the National Parks & Wildlife Service and are not disclosed in this report.

## Overview

- The Curlew Conservation Programme was established in 2017 to pioneer Curlew conservation efforts in Ireland. It is funded and co-ordinated by the National Parks & Wildlife Service (NPWS), of the Department of Housing, Local Government & Heritage, and the Department of Agriculture, Food & the Marine, using a comprehensive framework which includes surveys, nest protection, public & community engagement, combined with habitat restoration, maintenance, enhancement, and creation.
- The CCP involves a wide range of actors, proactively working to help the Curlew. Central to the CCP approach are the landowners where Ireland's last remaining Curlew breed. A locally-led approach is adopted. In 2023, nine geographical areas that are important for breeding Curlew in Ireland were assigned locally based teams, working with local landowners and communities, adapting techniques and efforts to suit local needs.
- The seventh year of the Curlew Conservation Programme in 2023 saw direct efforts in the following areas:
  - Stacks Mountains (Kerry)
  - Lough-Corrib North (Galway)
  - Lough-Ree (Roscommon/Westmeath)
  - North Roscommon/Mayo
  - Mid-Leitrim
  - North Monaghan
  - Donegal
  - Sliabh Aughties (Clare/Galway)
  - Laois/Kildare
- The local teams, known as Curlew Action Teams, (CATs), are comprised of three main roles:
  - Curlew Advisory Officer (CAO)
  - Nest Protection Officer (NPO)
  - Curlew Champion (CC)
  - An assistant role may be assigned to CATs where required (CATA).
- The CCP has annually been very well received on the ground, where the local teams liaise closely with landowners and local communities, (who are a central part of conservation efforts), in the search for, and protection of breeding Curlew.
- In the nine CCP operational areas in 2023, 48 Curlew pairs were recorded, (38 of which were confirmed breeders and 10 probable breeders). For comparison, the total number of pairs recorded by the CCP annually since 2017 has been a minimum of 46 pairs in 2017, a minimum of 42 pairs in 2018, 56 pairs in 2019 (41 confirmed and 15 probable), 64 pairs in 2020 (42 confirmed and 22 probable), 61 pairs in 2021 (34 confirmed and 27 probable), and 46 pairs in 2022 (26 confirmed and 20 probable).
- Of the 48 pairs recorded in 2023, some second and third nesting attempts were also located, bringing the total number of recorded breeding attempts to 54.

- Headstarting is a procedure by which eggs collected from wild birds' nests are incubated artificially. Chicks are hatched under controlled conditions, and reared in pens until they are deemed ready for release back to the wild. The main advantage of headstarting is that it provides a greater chance of chicks fledging compared to in the wild. Poor breeding productivity (the number of chicks fledged) is recognised as a driving factor in the population decline of Curlew internationally and in Ireland. Headstarting is a tool that is now used with greater frequency and scope in conservation programmes and is gaining traction. It is noteworthy that given its relative infancy, there is not currently conclusive evidence that headstarting is ultimately successful for Curlew (i.e., that it results in individuals with at least the same survival rate and fitness as non-headstarted individuals). It has at least been noted to result in greater numbers of chicks reaching fledging stage.
- The aim of headstarting is essentially to buy time by placing young fledged birds into the population, while the root causes of the decline are being addressed so that ultimately there can be a sustainable future for the species in a given area. In 2021, a single Curlew chick was reared by CCP via headstarting. This was brought on by particular circumstances, (see 2021 CCP annual report). In 2022 the CCP undertook a small-scale headstarting pilot operation in a pre-planned and strategic manner. The initial effort took the form of two selected CAT areas, Monaghan, and Kerry. This initial pilot was expanded in 2023 to include CCP areas in Roscommon/Mayo, mid-Leitrim, and Donegal. In the presentation of data in this report, headstarted clutches are reported separately to 'wild' non-headstarted clutches. Some Curlew pairs had headstarted and non-headstarted clutches, therefore a combined total is also discussed. A total of 49 Curlew eggs from 13 clutches were collected for headstarting, with 41 chicks hatched (83.7%), and 38 chicks fledged (77.6%), which equates to a productivity of 2.92 fledglings per clutch, many times what has been achieved in the wild in recent years.
- The satellite tagging of several adult Curlew (primarily males), by NPWS in 2021 & 2022, was again utilised by the CCP in 2023. This technique helped CATs track adult bird's movements, locate nests more easily and efficiently, to target measures, and ultimately feed into ongoing research into Curlew ecology and behaviour in Ireland.
- The Curlew Conservation Programme is now drawing to a conclusion. During the period of operation, the number of chicks calculated as necessary to maintain a stable population in the operational areas was reached and exceeded and the second national breeding Curlew survey of 2021 showed that Curlew in CCP areas were faring better than areas that were not receiving conservation effort. However, the population still declined, which is understandable given the scale of loss in the last three to four decades, where 98% of the population has been lost, along with a massively changed landscape and land-use and indeed national breeding range. Remaining pairs, in the absence of producing young chicks, are likely to have a old age profile and will

consequently the breeding population may continue to follow a downward trajectory in many places. Ultimately, conservation efforts have come at the 11<sup>th</sup> hour (or beyond) and landscape scale changes are urgently required if there is to be a future for Curlew in Ireland.

- In addition to reaching the identified thresholds for breeding productivity, the CCP had significant achievements in building knowledge of what was prior to the CCP, a poorly studied and surveyed species, in building skillsets, experience, and momentum. Above all, the programme built positive support for the Curlew, both nationally and internationally, but most importantly in the local areas where Curlews hold on.
- Future efforts for direct Curlew conservation will need to encompass various elements, most especially in relation to land-use and supporting landowners and communities where Curlew remain breeding. The immediate future sees the emergence of a European Innovation Partnership for breeding waders (including Curlew), under the Common Agricultural Policy Strategic Plan for Ireland (2023-2027), in addition to the national agri-environment programme, ACRES.

## Background

The first national breeding Curlew survey, undertaken between 2015 and 2017, found drastic declines of the national breeding population of Curlews. Whereas 3,300-5,500 pairs are estimated to have bred in the Republic of Ireland in the late 1980's, by 2017 estimates are there remained no more than 150 pairs, (O'Donoghue et al., 2019). This represents a decline of 96% in the breeding population. Breeding productivity is so low that population viability analysis, undertaken in 2017, predicts that unless an average of 0.425 fledglings are produced per breeding pair, that the Curlew will go extinct as a breeding species in Ireland before 2030, (Alan Lauder, unpublished data, 2017).

The National Parks & Wildlife Service, (NPWS), of the Department of Housing, Local Government and Heritage established the Curlew Conservation Programme, (hereafter CCP), in 2017. In 2020, the Department of Agriculture, Food & the Marine became partners on the CCP. This brought many positives, including the facility for the programme to have a presence in two additional areas, namely the Slieve Aughty mountains, and Laois/Kildare. This brought the total number of Curlew Action Teams operating across the country to nine.

A second national breeding survey undertaken in 2021 reports further declines and estimates a breeding population of no more than 105 pairs, representing a 98% decline from the population estimates of the 1980's, (Colhoun et al., 2022). The second national breeding survey also reported that Curlew populations appear to be doing better in areas where conservation actions are applied.

This report represents the main points of the Curlew Conservation Programme in 2023.



Image 1. Adult Curlew on Lough Ree (Photo Owen Murphy/CCP)

## Introduction

The Curlew Conservation Programme, (CCP), has been designed to deliver action on the ground, at local level, engaging with local people so that they are part of the project, not apart from it. The programme was financed and coordinated annually by the National Parks & Wildlife Service, and the Department of Agriculture, Food & the Marine.

Conservation efforts are undertaken in a wider context of ongoing threats and pressures, which have been identified, along with proposed solutions, by the Curlew Task Force, which in May 2019, produced a suite of recommendations for Curlew conservation in Ireland.

The CCP was implemented on the ground in the form of field surveys, working with landowners to protect nests from disturbance and predation (an acute issue in relation to breeding success), and habitat maintenance, restoration, enhancement, and creation. Community liaison, education, and promotion of Curlew were also significant aspects of the work undertaken. Each area has a locally based team to carry out these actions. In 2023, a total of 37 people were contracted to form the local teams between mid-March and early April, with contracts running through to late July and early August in some areas. Early season contracts, (January to early March), were given to Nest Protection Officers in particular areas. NPWS regional staff were centrally involved in several areas.



## Curlew Action Teams (CAT)

1. Stacks Mountains
2. Lough Ree
3. North Roscommon/East Mayo
4. Mid Leitrim
5. North Monaghan
6. Donegal
7. Lough Corrib
8. Slieve Aughties
9. Laois/Kildare



Figure 1. Curlew Conservation Action areas 2023



## Curlew Action Teams & The Curlew Conservation Partnership

The introduction of Curlew Action Teams in some of the most important areas has allowed for dedicated surveys and concrete conservation action there, The Curlew Conservation Programme (CCP), has now built a tangible profile for conservation efforts with the local communities and nationally. These teams were given dedicated geographical areas and the support and autonomy to provide local solutions that were appropriate to the sites in question.



Figure 2. Curlew Action Team (CAT) roles

The roles involved in the Curlew Action Teams are described as follows:

#### Curlew Advisory Officer (CAO)

This is the lead role locally. The Curlew Advisory Officer is the primary link between their local team, the local community, and the CCP Project Manager. The CAO is tasked with nest finding, nest protection, liaising with and providing advice to landowners, and coordinating team efforts on Curlew conservation, local administration, and ecological recording.

#### Curlew Nest Protection Officer (NPO)

Predation is a primary cause of breeding failure for Curlew, who are experiencing increasing difficulties in hatching eggs and rearing young, (Ainsworth et al., 2016; Franks et al., 2017). In order to give Curlew a better chance of rearing their young, nests are fenced to exclude ground predators whenever appropriate. Red Fox, (*Vulpes vulpes*), American Mink, (*Neovision vision*), Hooded Crow, (*Corvus cornix*), and Eurasian Magpie, (*Pica pica*), are removed from the immediate vicinity of Curlew breeding territories, (primarily within 1km of nest sites), and disturbed when coming close to nests by the Nest Protection Officers, (NPOs). These actions are carried out under license from the NPWS Wildlife Licensing Unit, and in accordance with the law. The NPOs also assist in efforts to find breeding Curlew, and in various other tasks undertaken by the wider team.

#### Curlew Champion (CC)

This is a vital role in fostering and maintaining positive relationships between the project and the community and widening the understanding among the general public of the situation in which the Curlew has been left. One of the main ingredients in realising success in any conservation project is to gain real buy in from the landowners and the local community. The Curlew Champion, (CC), is tasked with encouraging close working relationships between project personnel and landowners, building a positive profile for Curlew and the CCP among landowners and local community, highlighting issues, and proposing solutions. Most people contracted to the Curlew Action Teams are from the locality themselves, and this further helps with community and landowner engagement.

#### Curlew Action Team Assistant (CATA)

The breadth of the work involved in Curlew conservation efforts is significant and additional resources are required in some of the larger and busier areas. The assistant helps with various tasks, and the role is to be utilised as required, whether in terms of supplementing survey effort, community engagement, team administration, or any other aspect of the local team effort.

While the key tasks and responsibilities are set out for each individual team member, each team effectively functions as a unit, and all teams together strive towards a common goal across the nine areas of the CCP.

## Curlew Conservation Partnership

In order to engage proactively with those who own and manage lands where Curlew breed, the Curlew Conservation Partnership, (the public engagement aspect of the Curlew Conservation Programme), has been designed to allow payments for landowners, (primarily farmers but others where appropriate), for their time and effort with the Curlew Conservation Programme. Payments are operated under the auspices of the NPWS Farm Plan Scheme (NPWS, 2020), and any double funding/contradiction for works planned under the GLAS scheme are avoided. In areas where other environmental programmes are operational, communication between projects at management level and on the ground ensures compatibility and synergies.

Plans are designed and agreed with landowners/land managers to deliver a better environment for breeding Curlew. Payments can be made for various aspects of maintaining, creating, or improving habitat, and for a participant's time invested in liaising with the local CAT. The partnership element is very important in building strong and positive relationships between the local landowners and the local CAT. Gun clubs operating in the areas where Curlews breed have also been supported financially in line with plans that they outlined to help breeding Curlew.

The CCP has significantly built knowledge, skillsets, experience, and momentum. The programme has been widely supported, both nationally and internationally, and most importantly, in the local communities where it is active. 2023 was the seventh operational year of the Curlew Conservation Programme.



Image 2. Curlew nest on peatland habitat (Photo: Brian Hughes/CCP)

## Conservation Action in 2023

### Areas

The seventh year of the CCP saw direct conservation efforts in the following breeding Curlew areas:

- Stacks Mountains (Kerry)
- Lough Ree (Roscommon/Westmeath)
- North Roscommon/East Mayo
- Mid-Leitrim
- North Monaghan
- Donegal
- Lough Corrib North (Galway)
- Slieve Aughties (Clare/Galway)
- Laois/Kildare

A suite of actions is carried out with key methods employed including:

### Survey/Monitoring

At the outset of the breeding season, the same known geographical areas are targeted as in previous years. Should Curlew have been reported to the Curlew Action Team or NPWS during the breeding season outside of, but relatively close to CCP areas, CATs were encouraged to follow up on these reports and to monitor the breeding efforts and apply conservation measures if possible. Therefore, as the season progressed, the footprint of efforts in 2023 did not exactly match that of previous years.

Surveys were largely focussed within 3km of Curlew territories known since 2015, (the first year of the first national survey 2015-2017) but were not limited to those areas and a wide net was cast by the Curlew Action Teams where they sought and received reports of Curlew from elsewhere in the regions. Word of mouth, local media, and outreach materials were used to seek reports of Curlew during the breeding season. CATs and/or NPWS staff in each area adopted survey techniques to suit their landscape, terrain, and individual site requirements. A combination of walkover surveys, vantage point surveys, tape lures, and discussions with local landowners were utilised. For the lake territories, (Lough Corrib and Lough Ree), added logistics including the use of boats to access islands brought its own intricacies in terms of avoiding disturbance on approach. Although each CAT had the flexibility to adopt survey techniques that best suit the local circumstance, data collection was standardised and collated centrally.

Some of the core objectives of the survey work were to determine where the Curlew were nesting, where they were feeding, and the outcome of breeding efforts. Determining nest location was imperative to directing nest protection efforts, providing the source of eggs for headstarting, and informing habitat maintenance, creation or enhancement works. Data pertaining to breeding results are also central to inform the Birds Unit of NPWS, who has the remit for Curlew policy, data, and research.

In 2023, survey efforts were again supported by satellite tagging, (under license), a procedure now in its third year. Specialist NPWS staff captured via cannon netting, 6 adult Curlew, 4 male & 2 female at four locations at the onset of the breeding season. These birds were fitted with small, glued-on satellite tags to track their movement. One tag malfunctioned and one bird did not breed, thus data was captured on four breeding adults for 2023. These tags provided invaluable information on roost sites, feeding sites, and crucially, nest location. This allowed for targeted conservation actions to be implemented, including predator control, nest protection measures, and farm/habitat management actions such as delayed mowing or grazing.

Satellite tagging in 2023 resulted in the locating of five nests in CAT areas. Areas targeted were Roscommon/Mayo, mid-Leitrim, Slieve Aughties, and Laois/Kildare. Several crucial learnings were recorded, including one pair in mid-Leitrim CAT that moved 27km from their primary nest site post headstarting to build their secondary nest in Co. Roscommon. Another pair, also in mid-Leitrim, nested a total of three times with early predation thought to be the driving factor behind re-nesting. Although the primary nest was predated after it had been fenced, and the secondary nest was predated before nest protection measures could be put in place, both with a minimum of two eggs, the birds remained loyal to the area and nested for a third time in the same field as they had built their primary nest. The tracking of these birds would be near impossible without the utilisation of technology such as tagging, and this brought new learnings to the CCP again in 2023.



Image 3. Curlew incubating on nest hidden in grassland, highlighting the difficulty in locating nests, (Photo: Kyle Sweeney/CCP)



## Nest Protection

Predation of Curlew nests (eggs and chicks) has been identified as excessive and population viability analysis shows that in the absence of action, Curlew will become extinct as a breeding species before 2030, (Lauder. A, unpublished data). Large-scale afforestation of Curlew breeding grounds including peatlands and high nature-value farming lands in the past 30-40 years, has provided the Curlews natural predators with new areas of cover, shelter, and breeding habitat (Hancock et al., 2020). The need for predation risk management was identified as an immediate and core requirement by the CCP from its inception in 2017 and has been identified as necessary in publications (e.g. McMahon, 2020) and various fora including the Curlew Task Force. Predation Risk Management, (PRM), under the CCP, strives to reduce the threat of direct predation to the Curlew's eggs or chicks, or indeed the birds themselves, and to give the birds an increased chance of survival during the short but crucial window between egg laying and fledging young. PRM employs several different approaches, as outlined in the NPO role description, and the efforts of the CCP are believed to benefit a wider array of species beyond the Curlew alone.

Nest protection efforts included the selective removal of American Mink, (*Neovision vision*), Red Fox, (*Vulpes vulpes*), Eurasian Magpie, (*Pica pica*), and Hooded Crow, (*Corvus cornix*), is carried out in defined areas as required, under license from NPWS Wildlife Licensing Unit, and in accordance with the law.

Another effective tool for Predation Risk Management, which the CCP has pioneered in an Irish setting, is that of nest protection fencing. Now a widely used tool on the PRM spectrum nest protection fences are utilised to protect known nests from ground predators. In 2023, eighteen clutches were protected by nest protection fences. Ten of these were headstarted, all of which reached hatching and of the remaining eight clutches, seven reached hatching stage (87.5%), with one clutch thought to have been predated by avian predators. The effectiveness of nest protection fences, and the impact that ground predators are having on the species is evident in the high hatching rate for those sites where nest protection fences were used.



Image 4. Adult Curlew with newly hatched chicks inside a protective fence  
(Photo: Peter Daly/CCP)



Image 5. Predator exclusion fence at Curlew breeding site in Donegal (Photo: Barry O'Donoghue/CCP)

The winter period of 2022/23 saw significant planning and delivery of a capital infrastructure project, to build a 1.9km long, 2m high predator exclusion fence at a site in Donegal. The area encapsulated over 19ha of high-quality Curlew habitat, where Curlew have traditionally and annually bred. The fence was partially buried underground to dissuade mammals burrowing into the protected area. The farmer was engaged with to keep sheep off the land for the most vulnerable period, given sheep are known to eat eggs, including Curlew eggs. The entire effort, coordinated and delivered by NPWS and implemented with the central roles of the local landowner, the Fencing People (fencing contractors) and the local Curlew Action Team, proved fruitful, with the birds returning in 2023, and rearing at least two young successfully. It is known that various other threatened ground nesting species also nested in the protected area, including Snipe, Meadow Pipit and Skylark and it is taken that the fence similarly benefitted these red and amber-listed species. The fence, which is made of long-lasting durable material, gives great hope for the locality into the future, that the trend of extinction may be halted and even reversed, with young birds hopefully being reared every year.



### Community, Landowner and Public Engagement

Curlew is a well-known and much-loved bird in Ireland with links to landscape, literature, cultural, and social heritage dating back centuries. It holds a special place in rural communities within which the CCP operates, often reminding people of long summer days in the bog accompanied by the Curlew's call. Naturally, given the serious decline of the population, conservation efforts for Curlew in Ireland have been of interest to the public and the work of the CCP has been featured in local, national, and online media, including newspapers, radio, television, and social media coverage. Education in local schools has been a feature of the CCP annually, aiming to instil a sense of pride and knowledge as to how important these areas are for the last remaining Curlew. In 2023, the CCP featured on several media sources, including two RTÉ Radio One programmes, (Countrywide and Morning Ireland), RTÉ Lyric FM, and several local radio pieces conducted to inform the public of the current plight of the Curlew and to generate an awareness of the importance of informing the CCP or NPWS of any Curlew sightings. To mark World Curlew Day on 21 April, Curlew structures made from willow were situated in prominent areas within the CCP operational areas, including, Tooreen, Charlestown, and Cong in County Mayo, Drumshanbo in Co. Leitrim, Lyrecrumpane in Co. Kerry, and Wild Ireland Wildlife Park in Co. Donegal. Efforts were made to engage with local stakeholders to highlight the importance of the local habitat and generate local buy in to further conservation efforts.



Image 6. Members of the Roscommon/Mayo CAT with interested locals and participating landowners in Charlestown, Co. Mayo on World Curlew Day, April 21<sup>st</sup>, (Photo: Seán Harrison/CCP)

The positive profile of the CCP has been important in building and maintaining public support for the species and wider nature conservation. This was backed up on the ground by good public relations through the local Curlew Action Teams, which themselves are primarily made up of local people. Engagement with local people, particularly landowners and farmers, has been a central tenet of the CCP. Many Curlew territories were discovered thanks to the help of landowners and the local community, who play an invaluable role with their knowledge of

the locality and historic Curlew sites. In 2023, three new confirmed Curlew breeding sites were located in Counties Sligo, Donegal, and Galway through reports from members of the public, submitted to NPWS or local CATs. Habitat enhancements works have also been undertaken by landowners in CCP areas in 2023 in support of the Curlew.

Signs were erected in certain CAT areas to inform dog walkers or other individuals to be mindful of breeding birds and encourage the avoidance of undue disturbance. Wildfires were once again an issue for some territories in 2023, with two large wildfires reported in Curlew breeding areas in the Roscommon/Mayo CAT area.



Figure 3. Proofs of signage used on CCP in 2023

## Headstarting

Headstarting, carried out under licence, is a procedure by which eggs collected from wild birds' nests are incubated artificially (Collins et al., 2016). Chicks are hatched under controlled conditions, and reared in pens until they are deemed ready for release back to the wild (Cunningham et al., 2015). The main advantage of headstarting is that it provides protection from chick loss in the short but crucial window between egg laying and chicks fledging. Chick loss and poor breeding productivity have become primary factors in the population decline of Curlew. Headstarting is a tool that is now used with greater frequency and scope in many conservation programmes and is gaining traction as a powerful conservation tool. Its aim is to help populations of endangered species recover, or at least sustain themselves, while the root causes of their declines are being addressed.

In 2021, a single Curlew chick was reared by CCP via headstarting. This was brought on by particular circumstances, (see 2021 CCP annual report). In 2022 the CCP undertook a small-scale headstarting pilot operation in a pre-planned and strategic manner, (see 2022 CCP annual report). The initial effort took the form of two selected CAT areas, Monaghan, and Kerry, with the local Monaghan team taking on incubation and early & late-stage rearing duties, while Fota Wildlife Park supported the Kerry CAT in the incubation and early-stage rearing processes, with the chicks returning to Stacks Mountain for late-stage rearing and release.

This initial pilot was expanded in 2023 to include CCP areas in Roscommon/Mayo, mid-Leitrim, and Donegal. Monaghan CAT again incubated eggs locally and reared the chicks from hatching to fledge. All other areas transported eggs to Fota Wildlife Park for incubation and early-stage rearing before returning chicks to their natal site for late-stage rearing and release.

A comprehensive working document was also developed to help guide and advise CATs of best practice in each stage of headstarting, from egg collection through to incubation, early & late-stage rearing, pen construction & location, and release. The working document was compiled from ideas and experiences provided by a host of sources, including at NPWS, Fota Wildlife Park, the Wildfowl & Wetlands Trust, and CCP team members with previous headstarting or bird husbandry experience. The working document formed the basis of a protocol for headstarting to be implemented in a standard way across the five selected CCP areas. The protocol (and application of effort) was updated with learnings from 2023 as the season progressed.



Image 7. Local CAT & farmer busy with pen construction in Stacks Mountains, (Photo: Seán Harrison/CCP)

A huge effort was made by CATs in nest finding, pen construction, chick rearing and predator control in the areas where headstarting took place, an additional workload at an already busy time of the season. A total of seven release pens were built across five CAT areas, with Monaghan CAT also building an early stage rearing pen.

The immediate area of the release pen was fenced with several layers of electrified fences to provide security from ground predators. The immediate area was also subject to targeted NPO efforts in the weeks leading up to birds arriving at pens, for the duration of the late-stage rearing, and for the days/weeks after release. All release pens were monitored via Reolink cameras for the duration of rearing process, to aid in remote monitoring and regular check ins from nominated Curlew Keepers.

It is noteworthy that given its relative infancy, there is not currently conclusive evidence that headstarting is ultimately successful for Curlew (i.e., that it results in individuals with at least the same survival rate and fitness as non-headstarted individuals). It has at least been noted to result in greater numbers of chicks reaching fledging stage.



Image 8 Newly hatched Curlew chicks at Fota Wildlife Park incubation hub (Photo: Seán McKeown/Fota WP)



Image 9 Curlew chick c.21 days (Photo: Kyle Sweeney/CCP)

## Populations (results and breeding outcomes)

Being ground nesters, Curlew rely heavily on camouflage and concealment to rear their chicks successfully. They are by nature elusive birds while breeding, and as such are notoriously difficult to survey in their breeding habitat. Hence, it can be frustratingly hard to determine precise nesting locations and the number of young fledged; (breeding productivity). In some cases, it could not be determined with certainty if a single bird had a mate, or if two birds together had settled to breed. Therefore, a minimum<sup>+</sup> (number of confirmed pairs only) and a maximum<sup>#</sup> (number of confirmed pairs plus probable pairs) are presented in Table 1, which summarises the results of each of the CAT areas for duration of programme.

Where a pair was noted to have fledged young, (e.g., young seen/heard or adults exhibiting protective/chick communicative behaviour +40 days from recorded hatch date, or fledged chick seen +40 days old and capable of flight), and where the number of fledglings was uncertain, a value of one fledgling was noted. Although more may have been fledged, it can only be stated with certainty that at least one fledged. Furthermore, in the interests of consistency and reliability, breeding productivity was taken as a minimum number of fledglings produced by pairs that were confirmed breeding.

Table 1. Survey results for breeding Curlew in CAT areas 2017-2023

Region	2017 <sup>o</sup>		2018 <sup>o</sup>		2019		2020		2021		2022		2023	
	Min.+	Max.#	Min.+	Max.#	Min.+	Max.#	Min.+	Max.#	Min.+	Max.#	Min.+	Max.#	Min.+	Max.#
Stacks Mts.	6	6	6	6	2	6	2	5	1	1	1	1	1	1
Lough Ree	16	16	16	16	14	17	14	18	8	16	8	14	11	13
Roscommon/Mayo	5	5	5	5	5	6	5	7	4	8	3	7	6	7
Mid-Leitrim	4	4	5	5	8	11	8	11	5	9	6	6	7	7
Monaghan	4	4	5	5	3	6	2	7	2	5	2	3	2	3
Donegal	2	2	3	3	4	4	3	3	3	4	2	2	3	4
Lough Corrib Nth.	9	9	3	3	5	6	7*	7*	*7	*7	1	5	2	4
Slieve Aughties	N/A	N/A	N/A	N/A	N/A	N/A	0	2	3	6	2	4	5	5
Laois-Kildare	N/A	N/A	N/A	N/A	N/A	N/A	1	4	1	5	1	4	1	4
<b>Totals</b>	<b>46</b>	<b>46</b>	<b>42</b>	<b>42</b>	<b>41</b>	<b>56</b>	<b>42</b>	<b>64</b>	<b>34</b>	<b>61</b>	<b>26</b>	<b>46</b>	<b>38</b>	<b>48</b>

\*One of these pairs was on South Lough Mask, (7km from nearest Lough Corrib pair)

<sup>+</sup>Confirmed breeding pairs only. <sup>#</sup>Confirmed pairs plus probable breeding pairs. <sup>o</sup>Minimum pairs only recorded.

The number of confirmed breeding pairs in the areas covered by the CATs since 2017 had remained relatively stable until 2020, but it dropped significantly in 2021, and continued to do so again in 2022. In 2023 reports show a positive rebound and an increase in confirmed pairs, (38, up from 26 in 2022), and a slight increase in the maximum pairs recorded, (48, up from 46 in 2022), see Table 1 above. This positive increase should be interpreted with caution when compared with data from the CCP since 2017, with the overall trend down on historic reports.

Many of the active pairs made it to nesting stage, with 43 clutches recorded across all CCP areas. 34 out of 38 minimum pairs recorded reached hatching stage (89.5%).

Population figures are not comparable across the years since the inaugural year of the CCP in 2017. This is principally because the Irish Breeding Curlew EIP was established in 2018 in



South Leitrim, and in 2019 in South Lough Corrib, both areas where the CCP was originally active. Consequently, there were no surveys by the CCP in South Leitrim since 2017, nor in South Lough Corrib since 2018. Data for those two areas were collected by the Irish Breeding Curlew EIP. Also, the original CAT area of North Roscommon-Leitrim has evolved into two separate areas, Roscommon/Mayo, and Mid-Leitrim.

For ease of interpretation and to keep consistency with historical records, only population figures excluding the headstarted chicks will be discussed here. Separate tables will detail population outcomes for headstarting and an overall total when those headstarted attempts are included, see tables 3 and 4 below.

Table 2. Survey results for breeding curlew in CAT areas 2023 (excluding headstarted efforts)

Region	Min. Pairs <sup>+</sup>	Max. Pairs <sup>#</sup>	Min. No. Eggs	Min. pairs reached hatching	Min No. eggs reached hatching	Min. pairs reached fledging	Min. number of fledgelings	Min. Breeding Productivity
Stacks Mts.	1	1	3	1	1	0	0	0.000
Lough Ree	11	13	17	10	14	2	2	0.182
Roscommon/Mayo	3	4	7	2	6	0	0	0.000
Mid-Leitrim	3	3	12	2	6	0	0	0.000
Monaghan	0	1	0	0	0	0	0	0.000
Donegal	2	3	6	2	6	1	2	1.000
Lough Corrib	2	4	8	1	4	0	0	0.000
Slieve Aughties	5	5	3	5	3	0	0	0.000
Laois-Kildare	1	4	4	1	3	0	0	0.000
<b>Totals</b>	<b>28</b>	<b>38</b>	<b>60</b>	<b>24</b>	<b>43</b>	<b>3</b>	<b>4</b>	<b>0.143</b>

<sup>+</sup>Confirmed breeding pairs only. <sup>#</sup>Confirmed pairs plus probable breeding pairs.

Of the 28 non-headstarted, 'wild' pairs, 24 reached hatching stage, (85.7% breeding success). The number of eggs recorded was 60 with a minimum of 43 chicks hatched (71.6% eggs reached hatching), and a minimum of 4 birds fledged. This was up from the 37 chicks hatched in 2022, but considerably lower than the 57 chicks hatched in 2021. At least three of the 28 pairs reared young to fledge, (others possibly did so also, but were not confirmed). Breeding success rate was 10.7%.

However, there were a minimum of 41 breeding attempts recorded, (not counting the headstarted clutches) with some losses to predation reported. If the 41 breeding attempts are considered, with only 24 confirmed reaching hatching stage, this represents a considerably lower breeding success rate of 58.3%. Fledging success was also much lower in 2023 with only three confirmed 'wild' pairs rearing chicks to fledgling stage (+40 days and capable of flight) from the 28 confirmed breeding pairs, but this may have been more. This represents a fledgling success of 10.7% for non-headstarted pairs. Several unknowns were recorded across the CCP, which may also skew this particular data point.

With a total of only four fledglings produced in the wild from the 28 confirmed breeding pairs (excluding the probable breeders), this represents a minimum breeding productivity of 0.143 fledgelings per breeding pair, which is well below the threshold of 0.425 required for a stable

population. The true productivity value is unknown as outcomes for 15 breeding attempts were unknown; the true value could have been higher or lower. This represents 27.8% of all breeding attempt outcomes were unknown in 2023.

Only the Donegal CAT area had a breeding productivity above the required threshold, with a productivity rate of 1.0 fledglings per confirmed breeding pair, thanks to the great efforts of the local team, farmers and the significant infrastructural development of the predator proof fence.

For comparison, in previous years of the CCP, breeding productivity has been reported as 0.38/pair in 2017, 0.43/pair in 2018, 0.81/pair in 2019, 0.6/pair in 2020, 0.5/pair in 2021, and 0.5/pair in 2022. **It is important to note that the above values for 2023 do not include headstarted birds, and that headstarting in 2023 was higher than in any other year; so direct comparisons with previous years are not possible.**

The minimum number of fledged chicks reported for each year of the CCP were, 16 in 2017, (first year of CCP, 6 areas covered), 19 in 2018, (7 areas covered), 33 in 2019, (7 areas covered), 25 in 2020, (CCP extended to 9 areas covered), 17 in 2021, (9 areas covered), and 12 in 2022, (9 areas covered).

The minimum number of pairs hatching chicks has remained at 24, the same number as recorded in 2022. However, it should be noted that 13 clutches were headstarted and this may skew this data point. Had these clutches not been headstarted, and nests provided with nest protection measures in-situ, many if not all of these clutches may also have reached hatching in the wild, as had been the experience in previous years.

Table 3. Survey results for breeding Curlew in CAT areas 2023 (headstarted efforts only)

Region	Clutches Headstarted	Eggs Collected	Chicks Hatched	Chicks Fledged	Min. Breeding Productivity
Stacks Mts.	1	3	3	3	3.00
Roscommon/Mayo	4	16	15	15	3.75
Mid-Leitrim	5	19	15	13	2.60
Monaghan	2	7	5	4	2.00
Donegal	1	4	3	3	3.00
<b>Totals</b>	<b>13</b>	<b>49</b>	<b>41</b>	<b>38</b>	<b>2.92</b>

From the 13 pairs for which headstarting was confirmed in 2023, 49 eggs were collected, and from these eggs, 41 chicks reached hatching stage, with eight eggs lost during incubation, representing a 16.3% loss. The specific reasons for these losses are somewhat unknown, i.e., some eggs began to lose weight during the early weeks of incubation, (a common problem in egg incubation), and although measures were put in place in an attempt to save them, some eggs simply could not be saved. One egg was noted to have a pin hole in its shell upon initial inspection at Fota Wildlife Park, and although efforts were made to re-seal using wax, this egg also failed in the first week of incubation. Two others failed in the latter stages of development when they appeared to burst their own egg sac in the days prior to hatching. Another egg was found already perished in a nest of three eggs that was rescued. This represents a hatching



success rate of 83.7%, which is slightly above what is reported on other similar conservation projects.

For comparison, of the non-headstarted efforts, 43 out of 60 eggs hatched in the wild, representing a loss of 17 eggs between nesting and hatching (28.3% egg loss). Of these, 13 were lost to suspected predation (21.6% of 60) with the remaining four lost to reasons unknown, i.e., eggs did not hatch in the nest but were not predated, (6.7% of 60). This represents a 71.7% hatching success rate of wild eggs that receive conservation efforts on the CCP.

A further three headstarted chicks were lost post hatching due to other complications, (6.1% of all headstarted eggs), including one case of suspected aggression from older chicks while in the release pen, one case of impaction (autopsy showed the chick appeared to have ingested small pieces of plastic), and one predation by a buzzard on the day of release. A total of 38 birds were fledged through the headstarting project in 2023. This represents a fledged success rate of 77.5% for headstarted eggs. Similar programmes report fledging success rates of approximately 70-75%. For comparison, in 2023 the non-headstarted eggs on the CCP have a fledged success rate of 6.7% for non-headstarted eggs.

Overall, the headstarting project presents a healthy return of 2.92 fledglings per breeding pair, significantly higher than the 0.425 fledglings per breeding pair required for a stable Curlew population. However, although headstarting may give a much-needed boost to the number of birds being fledged, it does not address the underlying issue of habitat loss and degradation. Without a suitable habitat and landscape level restoration and management, these headstarted birds have no more of a chance of survival than the dwindling breeding populations we are witnessing today.

Table 4. Combined survey results for breeding Curlew in CAT areas 2023 (headstarted and non-headstarted effort)

Region	Min. <sup>+</sup> Pairs	Max. <sup>#</sup> Pairs	Min. pairs reached hatching	Min. pairs reached fledging	Min. number of fledgelings	Min. Breeding Productivity
Stacks Mts.	1	1	1	1	3	3.000
Lough Ree	11	13	10	2	2	0.182
Roscommon/Mayo	6	7	5	4	15	2.500
Mid-Leitrim	7	7	6	5	13	1.857
Monaghan	2	3	2	2	4	2.000
Donegal	3	4	3	2	5	1.666
Lough Corrib Nth.	2	4	1	0	0	0.000
Slieve Aughties	5	5	5	0	0	0.000
Laois-Kildare	1	4	1	0	0	0.000
<b>Totals</b>	<b>38</b>	<b>48</b>	<b>34</b>	<b>16</b>	<b>42</b>	<b>1.105</b>

<sup>+</sup>Confirmed breeding pairs only. <sup>#</sup>Confirmed pairs plus probable breeding pairs.

When headstarted and non-headstarted data is combined, results show a minimum of 38 breeding pairs (an increase of 12 on 2022), with a minimum of 42 fledged birds representing a breeding productivity of 1.105 fledglings per breeding pair for all CCP areas in 2023, see table 4 above.

However, headstarting is a tool that cannot be used indefinitely and as such, if headstarted fledglings are removed from the analysis, results show a different picture. A significant drop of fledged birds is noted in 2023, with only four fledged 'wild' chicks confirmed, a drop from the 12 reported in 2022, which had also seen a reduction from 17 fledged chicks recorded in 2021. With only four fledged birds from a minimum of 43 wild hatchlings, see table 2, this represents a 9.3% success in the number of chicks confirmed fledged from the 43 chicks hatched.

It should be noted that of the 13 pairs that were headstarted, only three secondary nests were located (23.1% of the headstarted pairs). Several of the remaining headstarted pairs are thought to have laid secondary clutches based on behaviour observed by CATs. However, this proved difficult to confirm, again highlighting the difficulty in locating Curlew nests and the constant threat of egg predation. The use of GPS tags proved invaluable for tracking pairs to re-nesting locations, with one tagged headstarted pair in mid-Leitrim CAT area located 27km away in Co. Roscommon on their secondary nest. Other pairs may indeed have nested again either in their historic nesting area, or further afield as was seen with this pair, which again highlights the difficulty of locating nests and putting in place nest protection efforts before the eggs are predated.

Nest protection fences have proven beneficial in progressing attempts beyond the egg stage to chick stage. Of a total of 50 breeding attempts protected by fencing to date, 40 have hatched chicks, an 80% success rate. In 2023, a total of 18 nests were fenced, 10 of these were headstarted (all producing chicks). Of the remainder, seven out of eight clutches that were fenced produced chicks, (87.5% success rate).

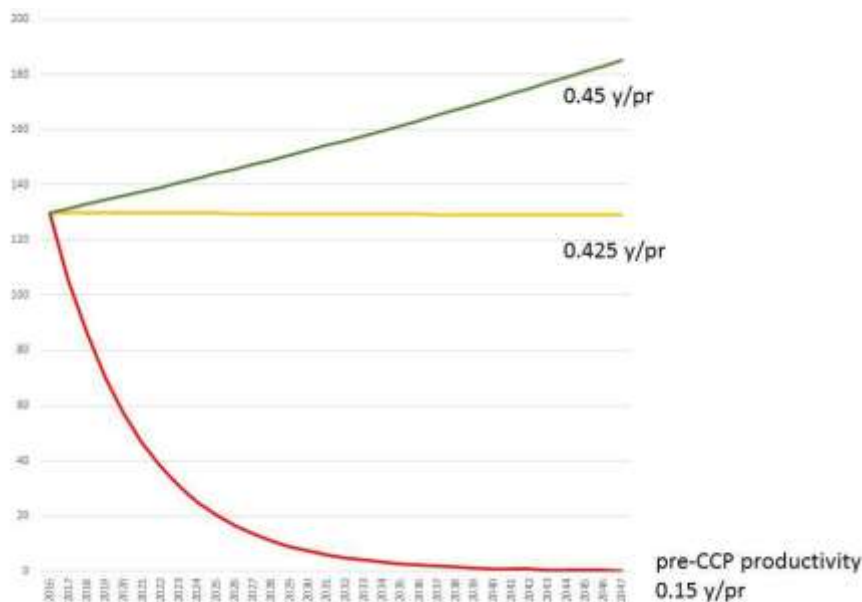


Figure 4. National Population Viability Analysis based on mixed data sources from NPWS/BWI/BTO/RSPB (Lauder, A., unpublished data)

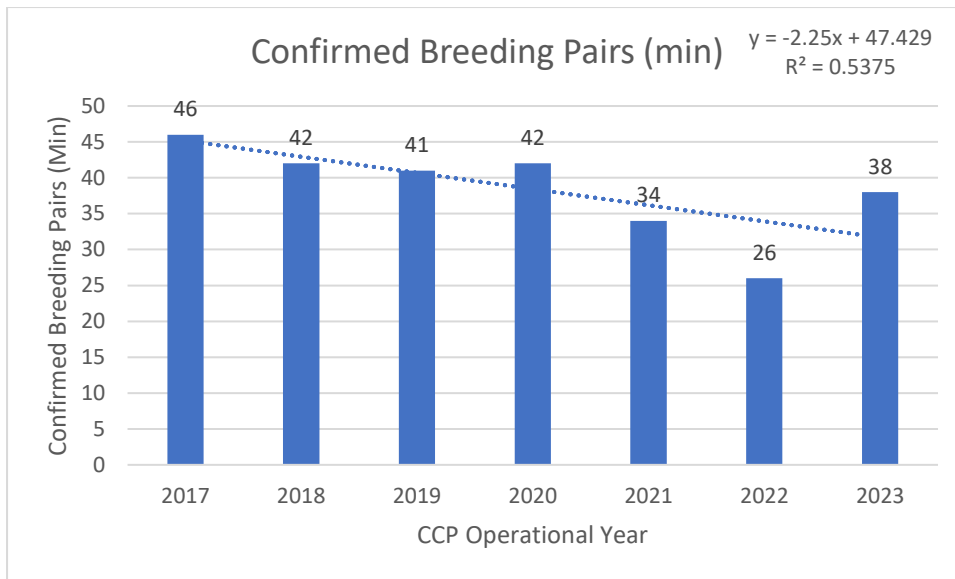


Figure 5. Confirmed breeding pairs for CCP (Min) 2017-2023

When confirmed breeding pairs data is analysed since the start of the CCP, see figure 5 above, it shows that although 2023 is up when compared to 2021 and 2022, there is an overall downward trend, with fewer confirmed minimum breeding pairs than were recorded in the four first years of the programme. Overall, minimum breeding pairs (38) is slightly lower than the average across the previous six years of the CCP (38.5 pairs).

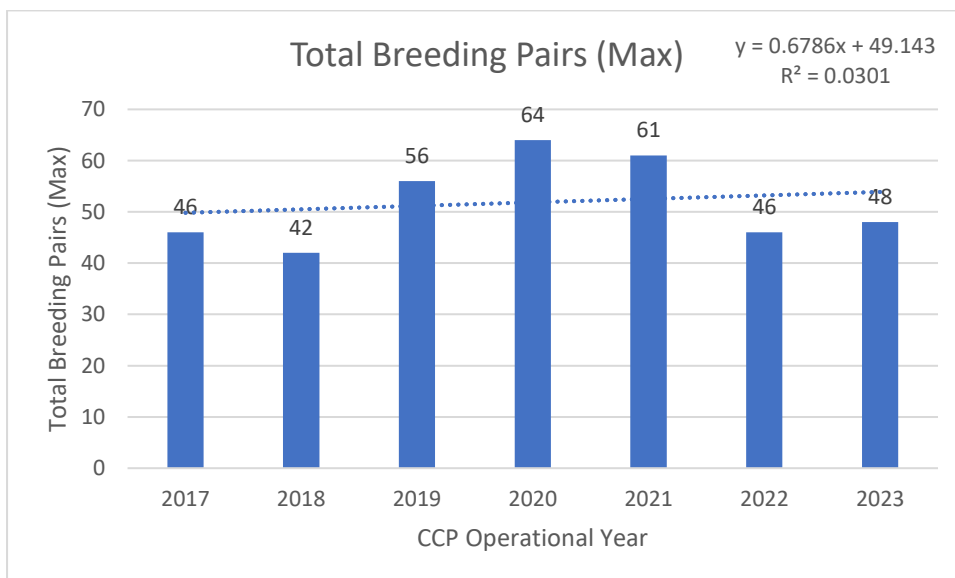


Figure 6. Confirmed Breeding Pairs for CCP (Max) 2017-2023

When maximum breeding pairs (confirmed + probable breeders) are compared, see figure 6, the 48 recorded in 2023, although higher than 2022, it is below the average (52.5) maximum pairs recorded over the previous six years of the programme, but the overall trend is slightly up since the first years of the CCP. However, if data is analysed since 2021, the year of the second national survey, it can be seen that in 2021 the maximum number of pairs recorded on the CCP was 61. This represented 58% of the second national population estimate of no more than 105 pairs. In 2023 the maximum number of pairs recorded on the CCP was 48,

representing 45.7% of the second national population estimate, a drop of 12.3% in the Curlew populations managed in CCP areas in the two most recent breeding seasons.

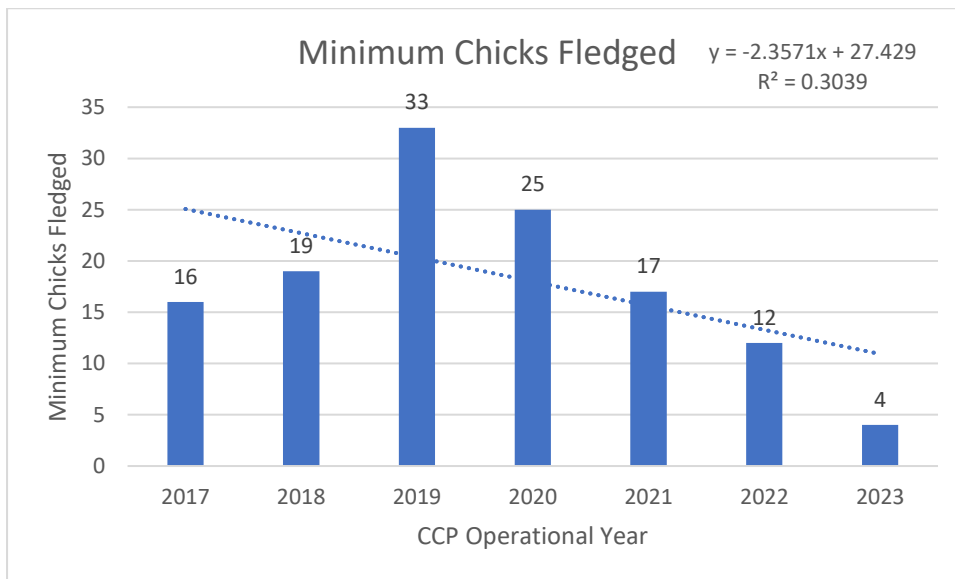


Figure 7. Minimum Chicks Fledged CCP 2017-2023 not including headstarted efforts in 2022 & 2023

Another worrying trend is the minimum number of fledged chicks recorded. This parameter has shown sharp decline in the past four breeding seasons, see figure 7 above. If this trend were to continue, it is likely imminent that Curlew will be lost as a breeding species in Ireland.

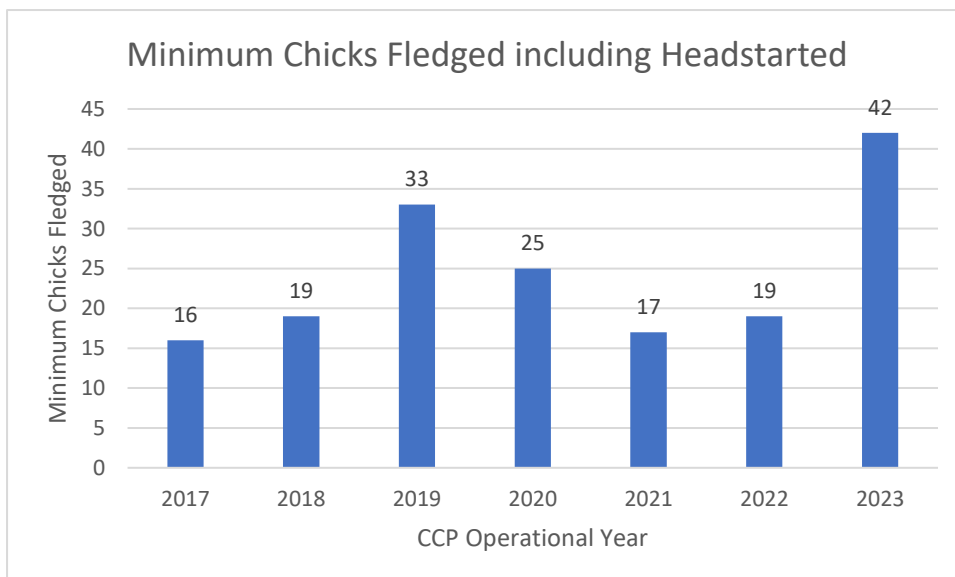


Figure 8. Minimum Chicks Fledged on CCP 2017-2023 (including Headstarted Chicks)

When headstarted chicks are included for 2022 and 2023, see figure 8 above, it shows that headstarting can be utilised to boost fledgling numbers significantly. In 2022 a 58.3% increase in the number of fledged birds is reported 19 up from 12 (+7), and in 2023 a 950% increase is

reported, 42 up from 4 (+38). The 2023 headstarting project also delivered the highest number of fledged birds (38) that the programme has seen since its inception in 2017, more than double the number of confirmed birds reported fledged in four of the past six breeding seasons.

Although headstarting can be utilised to influence the number of birds being fledged and can boost those numbers significantly, it does not address the core reasons behind the population contraction of fledged birds in the wild. Headstarting may be a useful tool to help stave off extinction in the near-term, but it is not the answer to the crisis the Curlew finds itself in.

## Discussion

For 2023, many of the key indicators are negative, the percentage of pairs fledging chicks in the wild, and overall number of wild chicks confirmed as fledged were again down from 2022, (which itself was also down from 2021). Some key indicators to show positivity were the number of confirmed pairs recorded (+12 on 2022), and number of chicks hatched (+6 on 2022). However, this should be viewed with caution as the longer-term trend is down, and these numbers are significantly lower than 2021 and 2020.

This is disappointing, given the progress that had been made by the CCP in the preceding years, and it is of extreme concern that seven out of the nine CAT areas did not fledge chicks in the wild in 2023. This is also particularly difficult for the local CAT members and team morale, CCP management, and the local landowners, who invested so much time and effort to safeguard chicks, following them on a daily basis from egg stage through to near fledged.

The pressing issues of habitat loss, degradation, and fragmentation, which have led to the current situation for Curlew, are still very much present, and in fact continues to expand and intensify, despite the best efforts of agri-environment and conservation measures. Until breeding habitats are properly restored, Curlew in Ireland are likely to continue to decline and be lost from some areas. The situation of breeding Curlew in the Stacks Mountains is extremely worrying as only one active pair was found there again in 2023. This was despite intense survey efforts by the local CAT. This mirrors the situation for other birds of conservation concern, most notably the Hen Harrier, (*Circus cyaneus*), for which the area is a designated Special Protection Area, (SPA).

Nest protection fences have proven beneficial in progressing attempts beyond the egg stage to chick stage. Of a total of 50 breeding attempts protected by fencing to date, 40 have hatched chicks, an 80% success rate. In 2023, a total of 18 nests were protected using fences, 10 of these went for headstarting. Of the remainder, seven out of eight 'wild' nests that were fenced produced chicks, (87.5% success rate). While fences have proven useful against predation by mammals, (e.g., Red Fox, *Vulpes vulpes*, Pine Marten, *Martes martes*, Eurasian Badger, *Meles meles*), they offer no protection from avian predators, (e.g., Hooded Crow, *Corvus cornix*, Eurasian Magpie, *Pica pica*), and one nest was predated in 2023 despite being fenced. Additionally, once chicks are mobile, they move beyond the fence at which point their risk of predation greatly increases. In 2023, only 9.3% of hatched wild curlew chicks were confirmed fledged (4 fledglings from 43 hatchlings). This highlights the need for targeted, systematic professional predator control in tandem with landscape scale habitat management to reduce the risk of predation to Curlew eggs, chicks, and adults.

Overall, 2023 was a disappointing year in terms of number of pairs returning to breed, and the number of chicks that were fledged in the wild. The various landscape habitat and environmental issues threatening the very survival of the Curlew as a breeder in Ireland are still prevalent. Modern agricultural practices such as silage production on a landscape level, see large areas of reseeded monoculture grasslands cut up to three times a year, depriving a vast array of ground nesting species, (bird species including Curlew, but also mammals and invertebrates), of the chance to successfully reproduce. Decades of afforestation, particularly

on upland bogs, have created a fragmented landscape that is acting against Curlew breeding success and survival. Hancock et al., (2020), shows how the population of predators like foxes can increase substantially when previously open areas are planted with forestry. The loss of bog habitats and wet fields continue, as does the burning of peatland vegetation, with two substantial peatland fires reported in the Roscommon/Mayo CAT area in 2023. While various regulations have been enacted, it is clear that damage and degradation continues to arise from various sources. Furthermore, changes in the landscape and in land-use, favours so-called generalist predators, often predators of Curlew nests and chicks. Predators such as Hooded Crow, *Corvus cornix*, Common Raven, *Corvus corax*, Eurasian Magpie, *Pica pica*, Common Buzzard, *Buteo buteo*, Red Fox, *Vulpes vulpes*, Eurasian Badger, *Meles meles*, Pine Marten, *Martes martes*, (all with stable or recovering populations), have detrimental effects on 'specialist' species such as Eurasian Curlew, which suffers twice, once from the degradation and fragmentation of their preferred traditional habitats, and secondly from the increase in range and density of some of its main predators. The development of wind farms and other renewable energy projects is also of particular concern. All of these issues, as well as the Curlew and the people who manage or have managed the Curlew's habitats, sit within a framework of land-use and land-use change.

**Stacks Mountain:** The Stacks Mountain CAT saw its second year in a row involved in the headstarting pilot. Three eggs were removed and successfully incubated, with the chicks reared, and released back to the wild in Co. Kerry. After egg removal for headstarting, the only recorded pair nested for a second time and nest protection measures were put in place. The adults hatched a single chick in the wild, this chick did not survive for more than one week old. The standing of the species in that area is still of great concern, with only one pair confirmed again in 2023, despite intense survey work and public outreach. Only a handful of sightings of single individuals outside of the CAT area were reported. A young bird that was being head started in Leitrim, but that was not thriving, was brought to Kerry and partnered with another chick in the rearing pen. Both were released together and effectively what started as three eggs in Kerry ended with four young birds released! A decision was taken to release the birds at a coastal site, into a non-breeding flock of Curlew. They were observed as part of the flock for some time later, identifiable thanks to their blue and yellow coloured rings.

**Lough Ree:** Traditionally one of the strongholds of Curlew in Ireland, recording healthy breeding populations and maintaining itself to historic levels, Lough Ree had a concerning year in 2023. The CAT area benefits from its island locations, with the vast expanse of water surrounding the islands effectively ensuring that one of the Curlews main predators, the red fox, *Vulpes vulpes*, is absent there. However, although an increase in breeding pairs was reported in 2023, (11 up from 8 in 2022), and it was reported that a minimum of fourteen chicks were seen/heard, only two chicks were confirmed as fledged on Lough Ree in 2023. However, there were several chicks that got very close to fledge age but were not confirmed as fledged but may well have done so. This highlights the difficulty and logistical challenge of surveying and monitoring some of the island nesting sites. Lough Ree was not involved in the headstarting project in 2023.



**Roscommon/Mayo:** Four pairs had their eggs headstarted in Roscommon/Mayo in 2023. From those 16 eggs, 15 fledged birds were released back to the wild at their natal sites. Of the pairs that were headstarted, the secondary nest of one pair was located, (although others were suspected of re-laying, location of secondary nests proved difficult to confirm). Nest protection efforts were put in place, and this pair hatched a further four chicks in the wild. These chicks survived to approximately three weeks old before they disappeared. No wild chicks were recorded as having reached fledged age in Roscommon/Mayo CAT area in 2023. A new site in south Co. Sligo was reported to Roscommon/Mayo CAT, with a minimum of two chicks observed with the adult bird. The outcome for this pair is unknown and this site warrants further survey and monitoring.

**Mid-Leitrim:** Five pairs had their eggs removed for headstarting in mid-Leitrim, (one of those nests was a breeding attempt rescued by CATs due to abandonment by both parents at hatching stage). A total of 19 eggs were headstarted, with 13 birds reaching fledged age. Of the headstarted pairs one secondary nest was located (a GPS tagged bird located 27km from primary nesting site), with the remaining three pairs suspected of relaying but this was not confirmed. From the non-headstarted nests, only four of which were confirmed, two were lost to predation at an early stage with only one and two eggs respectively, the other two reached hatching, but unfortunately chicks were thought to be lost to predation at c.8 days old. No wild chicks were recorded as fledged in mid-Leitrim CAT area in 2023.

**Monaghan:** Monaghan CAT also suffered a drop in the number of its breeding pairs, with only two confirmed in 2023. The close proximity the border with Northern Ireland creates its own particular challenge in this area, with birds moving between both jurisdictions. Seven eggs were removed from two pairs for headstarting in the local area. Five chicks were hatched, and of those, four birds reached fledged age, (one bird was predated outside the pen at 38 days old). Headstarted pairs were not relocated post headstarting but may have re-nested. No wild chicks were recorded as fledged in the Monaghan CAT area in 2023.

**Donegal:** Donegal saw good breeding productivity in 2023. A significant infrastructural project overseen by Barry O'Donoghue and Steven McGonigal and completed by the Fencing People Ltd., with input from Daniel and Martin Moloney and the farmer (name not included to protect location identity), was undertaken across the winter of 2022/23. At a traditional Curlew site in Inishowen, a predator exclusion fence encompassing more than 19 hectares of prime Curlew breeding habitat was constructed in advance of the breeding season. This investment paid dividends immediately in its first year, when a Curlew pair nested and reared four chicks within the fenced area. Fortunately, the chicks stayed within the fenced area for an extended period, availing of the protection offered, with two confirmed reaching fledged age and moving on with the parent bird. This was only made possible due to landowner cooperation, with specific changes made to the farming regime and sward management to support the Curlew chicks. Headstarting was also carried out at a separate Curlew site in Donegal. Four eggs were collected, and from those eggs, three chicks were hatched. Those three chicks reached fledged age and were successfully released back to their natal site when capable of flight, giving a minimum of five Curlews fledged in Donegal in 2023. A new site was

also reported to the CAT, with two chicks observed with parent bird. The outcome for those chicks is unknown, and further survey and monitoring of the area is warranted.

**Lough Corrib:** For the second year running, lough Corrib had a troubling year. Only two pairs confirmed reaching nesting stage with only one pair hatching chicks, but not reaching fledged age. Several pairs of suspected non-breeders were also recorded, which in itself poses more questions in regard to senescence, (too old to breed), or if these are juvenile birds that have yet to commence breeding, or if there are other issues at play that are yet to be realised. The Lough Corrib CAT area also benefits from its island locations, with the vast expanse of water surrounding the islands effectively ensuring that one of the Curlews main predators, the red fox, *Vulpes vulpes*, is absent there. Lough Corrib CAT however suffered with suspected predation of both nests recorded in 2023, and CATs recorded several incidents where the breeding Curlew were harassed for prolonged periods by Lesser Black-backed Gull, (*Larus fuscus*), and Common Raven, (*Corvus corax*).

**Slieve Aughties:** A disappointing season in 2023, with four confirmed pairs in the Slieve Aughties, down one from 2022. One pair was confirmed with a minimum of two chicks, but no fledged birds were recorded in 2023. Large post breeding flocks were noted in the area, and this warrants further monitoring to identify any ringed birds to inform of movement and range, post breeding season. Slieve Aughties CAT were also involved in the rescue of an injured Curlew chick from an unknown pair in Galway, this chick unfortunately did not survive its injuries, but the area where the chick was found warrants further survey and monitoring. Slieve Aughties CAT area was not involved in the headstarting project in 2023.

**Laois/Kildare:** Laois/Kildare was another CAT area with disappointing outcomes. Although having four recorded pairs, only one nest was confirmed. This pair hatched three chicks, unfortunately only one reached fledge age. However, this bird was never observed practicing flight and is thought to have been predated at c.42 days old. Laois/Kildare CAT area was not involved in the headstarting project in 2023.

In some areas it is highly likely that more than one chick was fledged than could be visually confirmed, but for obvious reasons the CCP can only include definitive results.

Overall, 43 clutches were recorded, (13 of which were headstarted), across all CCP areas in 2023, an increase on the 16 in 2022 and 34 in 2021. This is a real positive and required huge commitment from CATs to reach these targeted measures and locate such a high percentage of nests, (79.6%). A total of 109 eggs were recorded, (49 of which went for headstarting, and 60 eggs remained in the wild), up from 56 in 2022 and 57 in 2021.

Of the 60 eggs in the wild, a minimum of 13 are known to have been predated, (21.6% of all eggs in wild), and four eggs were found unhatched in nests and deemed to be unviable, (6.7% of all eggs in wild). A further 21 wild chicks were known or likely to have been predated post hatching and leaving the safety of the nest protection fence (35% of all eggs in wild), this may have been more.

Three headstarted birds were recorded to have been predated soon after release. The likelihood is that more of the headstarted birds were lost post release, as annual survival of

first year birds is low due to a combination of bird naivety and natural predation processes, but no evidence was found to confirm this. This also highlights the importance of site selection and a handle on predation risk in the vicinity of the release site and the surrounding areas where birds are likely to move to post release. Headstarted birds were held in the release pens to a greater day age in 2023 compared to 2022. This was to allow the birds to gain optimum condition and flight ability while in the safety of the pen, therefore providing them with the best chance to evade predation upon release.

Weather is likely a factor influencing breeding success in Ireland. In 2023, the months of April, May, and June were slightly warmer than average, which should aid in breeding success, however, temperatures dropped below average in July, and higher than average rainfall was recorded across the country at a time when hatched chicks were still vulnerable and some may have succumbed to the adverse weather conditions. The particularly wet July, which lasted into August also likely influenced invertebrate populations (crucial to chick diet), which can influence chick growth rates, and extend the time required to reach optimum fledge condition.

It should be considered that the Curlew population monitored and receiving conservation measures through the CCP represents approximately 46% of the Irish breeding Curlew population, with maximum 48 breeding pairs in 2023 from the 105 as reported in the 2<sup>nd</sup> national breeding survey (Colhoun et al., 2022).

## Conclusion

The conclusions drawn by the CCP at the end of 2021 and 2022 are still relevant today. Decades of habitat loss and degradation, combined with predation from multiple sources, is putting this critically endangered species on the brink of extinction as a breeding species in Ireland. It is taken that the more the population contracts, the higher the threshold should become if we are to maintain a population that existed in 2017, let alone thirty years ago. At a number of sites, where the Curlew did return, they did not settle to breed, while at other sites, birds did not return at all. Headstarting did bring solace and hope in 2023, but it is clear that the wider landscape issues and habitat quality and land uses impacting Curlew, still exist. Continual decline of the success of the species on sites that were historically consistent, now shows that these sites too are suffering, with both Lough Corrib and Lough Ree noting declines in fledged birds in 2023.

The second national survey in 2021 identified that areas where no dedicated conservation efforts are in place have seen greater declines than areas where conservation effort has been enacted. Greater intervention will be required, given the current crisis situation the Curlew finds itself in. Strategic large scale habitat remediation and improvement works are required to help ensure the future for a viable breeding population. The efforts of the CCP, (or other conservation efforts), are dwarfed by the larger landscape issues that have driven the decline.

The efforts of the CCP, particularly the local teams, in building and maintaining a positive profile for the Curlew cannot be overstated. Often, conflicts can arise between the desires of those involved in conservation and the desires of the landowner to manage their lands as they see best. The understanding and communication skills, (which involve listening as well as talking, of those involved in the CCP has been exemplary, and the experience to date has been largely positive with countless landowners and local people helping with reporting sightings, facilitating access, providing advice, and undertaking efforts to help the Curlew. With widespread concerns over the future viability of farming in these areas, many farmers are also seeing the value of conserving the Curlew, (and other habitats/species), by way of deriving an additional income via agri-environmental schemes, which may be the difference between their farming enterprise continuing or not.

It should be remembered at all times, that while conservation works such as the Curlew Conservation Programme and now ACRES, have been striving to help Curlew, the factors that brought the 98% decline in population continue to be present today, active on a larger and more intensive scale. The wider policy context that influences conservation, particularly in relation to land-use, has been examined by the Curlew Task Force, with a range of recommendations put forward for the immediate, medium, and long-term future of Curlew. Many sites and areas across Ireland have received no targeted intervention or actions.

However, there are some glimmers of hope. The 2023 CCP Headstarting project presents a solid method that can be employed to boost fledgling population numbers in the short term, with the hope of averting further population contraction, while buying time to address the habitat issues which are the core problem in the overall landscape. Although only in its second iteration as an extended pilot, results are very positive, and the project can easily be upscaled

as required with minimal cost. It should of course be noted again that the underlying issues of habitat loss and degradation still exist and without fixing these issues, the headstarted birds will face the same pressures as their predecessors.

The Curlew population continues to remain under immense pressure, and without change, the risk of extinction still looms in the coming decade. It is to be welcomed however, that previous projections for extinction (by 2026) have largely been staved off thanks to the efforts of dedicated people, landowners and communities. Planning for the immediate future is already progressing and the seeds for the next phase of Curlew conservation, following the first dedicated national efforts, have already been sown.



Image 10. Juvenile Curlew in feeding habitat, Co. Kerry, c.50 days old (photo: Hubert Servignat/CCP)

## Acknowledgements

All landowners, many of whom went above and beyond what was expected and required, who engaged proactively with, and facilitated the efforts of the Curlew Action Teams. Your assistance and encouragement were greatly appreciated by all concerned.

Ministers of State Malcolm Noonan and Pippa Hackett, for their unstinting support of and sincere interest in the Curlew Conservation Programme. Niall Ó Donnchú and Andy Bleasdale of National Parks & Wildlife Service for their leadership and vision. Hannah Denniston, Niall Ryan and Ted Massey of the Department of Agriculture, Food, & the Marine for their support of and partnership in the CCP and Michelle Kearney and her team for engagement on future efforts.

All who worked, contributed to, or provided input and advice to the CCP, including, Donal Beagan, Sinead Biggane, Killian Brennan, Neil J. Bourke, Vincent Campbell, John Carey, Joseph Connolly, Pat Compton, Mark Craven, Peter Curran, John Cusack, Peter Daly, Paul Doherty, Emmett Dolan, Hazel Doyle, Maurice Eakin, Robert Edge, Conleth Farrell, David Ferguson, Kathryn Finney, Jim Flynn, Frankie Flynn, Lorna Grehan, Brendan Harrison, Paddy Halpin, John Higgins, Brian Hughes, Laura Hynes, James Keane, Seán Kelly, Kevin Kyne, Adrian Lenihan, Brendan McCormack, Steven McGonigal, Pat McKenna, Joe McMahan, Enda Molloy, Daniel Moloney, Martin Moloney, Jacinta Murphy, Owen Murphy, Aidan O'Donoghue, Tim O'Donoghue, Eddie O'Flaherty, Kevin O'Meara, Louis O'Sullivan, James Owens, Chris Peppiatt, Brian Reidy, Harry Reynolds, Deborah Ricklin, Tim Roderick, David Ryan, Hubert Servignat, Joe Shannon, John Slattery, Kyle Sweeney, Andre Van Vuuren, Catherine Vernor, Alyn Walsh, and Noel Walsh.

Members of the public, and colleagues at the NPWS, who submitted records of Curlew during the breeding season, inside and outside of the core CCP areas.

Various members of gun clubs and environmental groups who worked closely with the efforts of the CCP.

Management and staff at Fota Wildlife Park for their invaluable assistance and expertise on the headstarting project, Julien Fontaneau, Jessica Hodnett, Sean McKeown, John McLaughlin, and Declan O'Donovan.

Management and staff at Wetlands and Wildfowl Trust for their invaluable assistance and expertise on the headstarting project Geoff Hilton, Nige Jarrett, and Tanya Grigg.

The Fencing People in Donegal.

Colleagues in various sections of the Department of Housing, Local Government, & Heritage and Department of Agriculture, Food & the Marine, for their goodwill and support.

All those who contributed to World Curlew Day, making it a success in raising awareness and support for the Curlew.

The various media outlets who featured the Curlew Conservation Programme in 2023. While operating at a national level, this very much about the local story and the local efforts to protect a bird that is very much part of our local areas.

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